

**Abstract**

The present invention is a method and apparatus for sampling a high-temperature gaseous process stream containing components with high boiling points. The sampling system is especially suited for instruments having extremely low pressure chambers, such as mass spectrometers. The invention reduces the condensation of high boiling point components of the sample in the sampling system without the necessity of maintaining extremely high temperatures. The gaseous sample is passed through an orifice from the high temperature stream into a lower-temperature zone of the sampling system where a low pressure is maintained by a vacuum pump. The low pressure reduces the boiling point of the sample components so they may be maintained in a gas phase without excessive heating. The low pressure sample is then introduced into an instrument chamber through a sample introduction valve.